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INTRODUCTION.

I. Receiving orders from the Conservator of Forests, Punjab, that I should report myself for duty to the Partabgarh Durbar, I arrived at Partabgarh on 9th June in the afternoon, and reported to the Assistant Resident, Mewar, for orders through the Secretary to the Maharaj Kunwar, Partabgarh, and was ordered to proceed to Banswara, but owing to the Maharaj Kunwar being on tour, supply of the guard ordered by the Assistant Resident could not be arranged till his return, and I was able to leave Partabgarh on the 18th June. Inspected part of Sohagpur-Partabgarh forest on the way; then again on arrival at Partabgarh-towards the end of July 1906, inspected forests round about Deolia on 1st, 2nd and 3rd August 1906. The remaining forests were visited between 21st October and 7th November 1906.

II. The whole of the forest area of this State is situated chiefly in Magra district, which is practically a forest area with scanty population of Bhils scattered all over in small hamlets. The only villages which have fairly large cultivated areas are Sohagpura, Achalpur and Nakor; Deolia, where the Durbar resides for a greater part of the year, is also situated in the forest area. Therefore, it is proposed to reserve the whole of the forest area, as no extensions of cultivation in this area are probable. The forest area is covered by various species of useful trees, of which teak is the most valuable as it can be used even when of a very small size as well as when of a big-sized tree. At present the stock is a mutilated one, but with protection it will become very valuable.

Areas
selected for
reservation.

III. At present the following kinds of trees that have commercial value are :—Teak, Sador, Haldu, Temru, Dhawra, Khair, Shisham, Rohin, Babul and Mahua; but there are others which, when of good size may, when placed in the market, command fair prices.

Trees that
have com-
mercial
value.

There are Ambia, Bia, Khejra, Kalam, Sewan, Jaman, Nim, etc. A list of more common trees found in the forests of the State are given as Appendix II.

Certain species, even when of small size, are used for house building and other purposes, although even these, when of large dimensions, are more valuable. These are :—Teak, Sador, Temru, Dhaura, Shisham and Khair, but there are others which are of very little value when of small size and, therefore, to be of real value they should be allowed to grow into big trees before exploitation. These are Ghorar, Sarin, Mahua, Haldu, Khejra, Mokha, Godlia, etc. These must of necessity be allowed to grow into six-feet trees before felling unless dead, dying, or decaying. There are trees which do not grow into more than three feet girth, at least such as Tenaj, Umbia, etc.

Fire
Conservancy.

IV. Fire should, as far as possible, be kept out as it is a very dangerous enemy of the forests. Measures usually undertaken to protect the forests from fire are :—

- (a) Clearing of fire lines along the outer boundary of the forests, so that fires lighted in the area, outside the forests, may have no chance of entering it.
- (b) Clearing a network of intermediate fire lines, so that the forests may be divided into a number of compartments, to save the other portions, if by chance fire occurred in any one of them.
- (c) To maintain a staff of fire watchers during the fire season.

V. The width of fire lines depends on the height and density of grass, and prevalence or otherwise of heavy winds during the fire season. These may be anything between forty and a hundred feet, and even more according to circumstances.

VI. The cost of protecting from fire in the Central Provinces is about two annas six pies per acre per annum, or Rs. 100 per square mile, and this cost will have to be incurred in the beginning, though afterwards it may be reduced to one anna six pies or so.

This cost under present condition of forests is prohibitive, but there is no reason why, even under partial protection, a larger proportion of the area may not be saved from fire. Public paths crossing the forests should be kept clear by burning a width of say twenty to thirty feet on each side so that there may be no chance of fire occurring through the carelessness of the travellers. To minimise the danger of fire entering from the fields situated in the reserve, a cordon round each village should also be kept clear.

VII. The people living inside the reserve or along the outer boundary may also be given to understand that the lighting of fires will not be allowed to pass unpunished. The villagers who conceal the offenders may have their rights in the areas burnt suspended for a period not exceeding five years at the discretion of the Durbar.

VIII. Small rewards may also be given to the villagers, in the case of forests, in which they have rights, escaping from fire.

IX. Fire lines should only be burnt at night time, as any sparks that may be carried away by the wind are easier noticed at night than during daylight. The fire travels slowly at night, and there is less danger of its getting out of control, and on account of coolness, the fire tracers can go nearer the fire to check it than during the hot part of the day.

X. In places where the boundaries of Partabgarh and Banswara forests are contiguous, a width of thirty feet, on each side of the boundary, to be kept clear jointly by the establishments of both States to save the expenses.

XI. Beyond the charge of royalty upon any forest produce that passes through the Customs Nakas, no check of any kind is placed on the people. Anybody may go into the forest and cut any tree, and in any way he pleases, and unless he has to pass through a Customs Naka, may use it in the way he likes without paying anything for it. This sort of freedom is detrimental to the forest growth; and should be put a stop to; *bonâ fide* wants of the villagers living inside the reserved forests or adjoining them may be met with, but under regulations and not at their own sweet will. For timber and bamboos Forest Officer's permission should be considered necessary. The Bhils may be induced to make mud walls for their huts, and thus the demand on forest produce will be diminished.

Right their
restriction
and
regulation.

XII. The rights enjoyed may roughly be divided into :—

(1) For which no previous permission should be considered necessary, these are :—

(a) Grazing for cattle being the *bonâ fide* property of the right-holder.

(b) Grass cutting.

(c) Dead and fallen wood for burning purposes.

(d) „ „ „ sale in head loads by Bhils only.

(e) Collection of wild fruits, flowers, honey, etc.

(2) Those rights for which previous permission of the Forest Officer may be deemed necessary, are :—

(a) Timber and bamboos for house building and for agricultural implements.

(b) Green trees to be felled for firewood purposes, only in case of their being no dry fallen wood available in the forest at a convenient distance.

If these suggestions be sanctioned and carried out the waste of useful material at present going on will be avoided, and the forest not only will be maintained in good condition, but the net surplus will also proportionately increase.

XIII. It is said that the grass in the black cotton soil situated nearer to Neemuch is comparatively more than the forest grass. The average freight per maund in Neemuch is four annas per maund from Saripipli, and it may be considered about the same from Partabgarh to Mandsaur Railway Station. The cutting and making of hay should not cost more than one anna per maund, as the grass is so very plentiful.

Utilization
of grass and
other minor
produce.

If arrangements could be made with any contractor who has to supply hay at some places beyond Ajmer, where hay is comparatively dear, the State would make a fair profit even if it can sell it at eight annas a maund.

XIV. Other minor produce are gums of Dhaura, Khankra, Acacias, Kurali, Albizzias, etc. Then there are roots, such as dhauli musli, etc.;

leases for collection of which may be given ; fruits such as mangoes and kernels of seeds such as chiraunji—the last two are not very numerous, being found only along the banks of Sita Mata Nala.

XV. Khankra and Bor cover fairly large areas, these species being suitable for lac culture. The lac seed should be obtained and introduced. These species are at present of little use but with the introduction of lac will give a fair annual outturn.

Demarcation.

XVI. The forests should be demarcated by means of boundary pillars situated at such distances that, standing on a pillar, one may be able to see one pillar on each side of it, and a clear line of say sixty feet, which will serve the purpose of both boundary and fire line. The pillars should be numbered consecutively.

PART I.

SUMMARY OF FACTS ON WHICH THE PROPOSALS ARE BASED.

1. The Partabgarh State is one of a group of States situated in the south of Rajputana. It is bounded on the north and north-west by Mewar, on the south and south-west by Banswara and Ratlam, and on the east and south-east by Gwalior and Jaura States of the Central India Agency.
1. Name and situation.
2. It consists of hilly land covered by forest vegetation in the north-west and western portions adjoining the Mewar and Banswara States; the rest being a flat open country without any forest growth.
2. Configuration of the ground.
3. The forest portion of the State is drained by:—
 - (a) The northern portion is drained by the Jakham and its branches. This river has its source in Mewar State, enters Partabgarh near Saripipli, and after a course of about twenty-five miles in Partabgarh re-enters Mewar, and running in a south-westerly direction joins the Som river in Dungarpur territory. A tributary of this river, called Sita Mata stream, is a perennial one.
 - (b) The central portion is drained by small streams which fall into the Mahi direct.
 - (c) The remaining forest area is drained by the Eran and its tributaries. This stream has its source near the town of Partabgarh, and joins the Mahi in the territory of Banswara.
- With the exception of the Sita Mata stream the others depend on the monsoon rains, and run for a period of four to six months, and are dry for the rest of the year.
4. In the larger portion of the State the underlying rock is trap, with sandstone beneath, but in the portion adjoining Mewar the underlying rock is sandstone. The soil is very variable in its nature and quality, at places stiff clay is found while at others sandy loam. At some places bare rock is met with, while at others boulders mixed with a slight amount of soil, but on the whole it is nowhere unsuited for tree growth. The places where it is at present poor will, if protection from fire be afforded in time, be fairly fertile.
3. Underlying rock.
5. The average mean temperature is about 81° and the average annual rainfall is 32 inches.
4. Climate.
6. The agricultural customs in the forest area are primitive, as with the exception of a few villages in which men of other nations are met with, the population is solely Bhils. But in the Malwa section of the
5. Agricultural customs and wants of population.

State Patels and other culturists are the rule. The wants of the population are mostly for small wood. Timber over twenty-inch girth is rarely used, and a length of over twenty feet very rarely demanded. The produce of the forests in a large measure is exported to the Cantonments of Neemuch and Nasirabad, but sawn timber has not been exported so far, as the Bhils are too lazy to learn the use of the saw.

Owing to large supply of wood and bamboos, etc. available, more forest produce is used by the people living in the Magra district than is absolutely necessary for their well-being, while large quantities are wasted not only for private use, but in cutting timber and bamboos for sale in bâts at Salimgarh, Arnodh, Salimgarh (Partabgarh), Damodar and Saripipli.

As no data is available for the quantity of timber and firewood consumed per head of population per annum, I state below that estimated for the Central Provinces :—

Wood and bamboos for buildings and for agricultural implements.	Mds.
Firewood	4
	5
TOTAL	9

7. The following kinds of trees are in demand :—

Teak (*Tectona grandis*), used for rafters, posts, beams, etc.

Sador (*Terminalia tomentosa*), for rafters and beams.

Tanaj (*Ongeinia dalbergioides*), for posts, ploughs, hoes, etc.

Temru (*Diospyros melanoxylon*), for beams, poles for carts rafters, ploughs, furniture, etc.

Khair (*Acacia catechu*), for house posts and agricultural implements.

Haldu (*Adina cordifolia*),

Rohin (*Saymida febrifuga*),

Ghorar (*Albizia procera*),

Mokha (*Schrebera Swieteniodes*),

} For beams, for house building.

Dhaura (*Anogeisus latifolia*), for cart axles, ploughs, etc.

Kakria (*Lagerstræmia parviflora*), for rafter, wood, etc.

Mohura (*Bassia latifolia*), for beams.

Shisham (*Dalbergia latifolia*), for furniture, etc.

Bans (*Dendro calamus strictus*), is used for roofing walls of Bhil huts, fencing, matting, baskets, etc.

8. Generally the demand on the forests for the requirements of the population may be said to consist of :—

Wood and Bamboos—For building, agricultural implements, furniture, carts, mats and baskets and for fuel.

Grass—For thatching, ropes, fodder and grazing.

Tanning—Chiefly the bark of Sador and Khejra and leaves of Dhaura, manufacture of spirits and articles of food ; the flowers of Mahua seed are manufactured into oil.

Besides the above, fibres are prepared, leaves used for thatching and other purposes, gums as medicines, etc., and roots are eaten and exported. At present trees are not allowed to grow into sizes to be of much use for Public Works such as Railways, etc.

II. THE COMPOSITION AND CONDITION OF THE FORESTS.

9. The forest area is situated to the north-west and west of the State, the greatest length being over forty-five miles and the mean length about thirty-two miles. The greatest width is about seventeen miles, and the shortest about two miles, the average width being a little over ten miles. Thus the forest area is about 320 square miles, and of this about forty square miles is under cultivation or occupied by village sites or otherwise surrounded by cultivated areas, therefore, the net area proposed for reservation is 280 square miles or slightly less than one-third the area of the State, which is 886 square miles. The forest zilla is very sparsely inhabited, and with the exception of a few villages in which Gujars and other cultivators are met with, is purely Bhil area.

1. Distribu-
tion and area.

There are ninety-five villages in Magra zilla, of which only two, Achalपुरा and Sohagपुरा, have been surveyed in the recent land revenue settlement. The Bhils, who form almost the whole of the population of this district, depend chiefly for support on the forest produce; taking this into consideration it is advisable that this area may be brought under systematic management to ensure its maintenance as forest land, as the Bhils look only to their present interests and no further. It has already been noticed that parts of the forests nearer the hâts have been cleared of bamboos and other valuable timber, and even in the remotest parts timber and bamboos of good quality are not met with, therefore, the area proposed to be reserved should, I think, be taken in hand.

10. No areas have as yet been demarcated.

2. State of
boundaries.

11. The State is the sole owner of the soil, and has all rights over land not given up for cultivation.

3. Legal
position.

12. Hitherto there has been no check on forests or forest produce with the exception that a royalty charge is made on all forest produce such as timber, firewood, bamboos, etc., that may pass through the different hâts (markets) fixed for this purpose for export. From this it may be construed that the villagers have a right to cut and use forest produce for personal use only and not for sale. These rights generally consist of:—

4. Rights.

- (a) Timber and bamboos for house building and for agricultural implements.
- (b) Firewood.
- (c) Grass, grazing and other minor produce for personal requirements and not for sale or barter.

13. The crop is generally a mixed one of Teak and its companions the Dhaura, Khuakra, Sador, Temru, Rohin, Karaili, Salar, Khair, Bamboos, etc., the Teak comprising from one-sixteenth to one-half of the

5. Composi-
tion and
condition of
the crop

entire stock. But there are certain areas where no Teak is met with. These are the water-logged soil in low-lying situations where nothing but Khankra would grow.

(2) Flat places with light gravelly soil consisting chiefly of Khair pure or mixed with Khejra and Babul. (3) The rocky soils where Salar and Karaili are the only trees met with. But the greater portion of the forests does contain Teak in however small proportion it may be. The trees, except of Salar and Karaili in remote places, are all badly mutilated and on bad basis. Large grassy blanks intervene these types sometimes. For instance there is a large grassy blank between Kotwal and Datiar and a still larger one round Rampuria and other villages.

14. The forests having been cut by the people at their own sweet will, the growing stock is mostly in a mutilated form. Only those species which are preserved by the people for their fruit such as Mahua, Chiraunji or which are not considered fit for any use have not been touched, and the trees of these species are only found in any size. No trees that are of any commercial value in their younger stages such as Teak, Shisham, Sador, Dhaura, etc., are allowed to grow beyond pole stage. Near Partabgarh the trees of inferior kinds such as Salar and Godlia even are not respected.

15. The trees are cut in such a barbarous way that no stumps fit for counting annual rings were bound. Teak, the most valuable tree in the forest, is in this State on its northernmost limit and cannot be made to grow into large-sized trees such as are found in its proper home.

16. No data are available as to production per acre of the produce of various descriptions. Only timber and a small amount of firewood—owing to absence of roads and difficulty in making them without incurring heavy cost, which at present cannot be provided for—can at present be sold. The proportion of saleable kinds of wood is greater in the forests of this State than in Banswara and Dungarpur, but owing to the mutilated nature of the growing stock and the small size of the trees comprising that stock, it is not desired to take out more than a ton per acre of small-sized timber. But the production is sure to increase from three to four tons per acre with protection and improvement of the stock. The rate of growth is not known, and with the present simple plan it is not necessary.

6. Injuries
to which the
crop is liable.

17. That annual fires are the most dangerous cause of injury to which the crop is at present liable. Even before the grass is fully dry the Bhils begin to burn it, and this results in killing almost all seedlings of the year, injuring more or less the bigger trees, and thus rendering them liable to the attacks of fungii and insects.

Drought is another danger from which the trees suffer. In years when the rainfall is exceptionally low the trees, together with other vegetation also, suffer, though less severely. Hot winds also to a certain extent are injurious. The frosts are not common and only occur at long intervals. Insect pests are the last but not the least dangerous.

III.—SYSTEM OF MANAGEMENT.

18. There has practically been no system of management of the forests, but a system of levying royalty on forest produce exported on passing the well-defined Customs Nakas is still the rule. 1. Past and present system of management.
19. No works of improvement have ever been undertaken. 2. Special work of improvement undertaken.
20. The annual revenue derived from timber and other forest produce is about Rs. 7,700. The expenditure has hitherto been included in that of the Customs Department. 3. Past revenue and expenditure.

IV.—UTILIZATION OF THE PRODUCE.

21. The marketable products are :— 1. Marketable products quantities consumed in past years.
- (a) Timber of various species such as : Teak (*Terminalias*), Temru, Tanaj (*Albizzias lebbeck*) and (*Procera*) Haldu (*Adina cordifolia*), (*Dalbergia latifolia*), (*Bassia latifolia*), Mokha, Kaura, etc., are available, though at present generally of small sizes.
- (b) Firewood in large quantities though not yet sold extensively.
- (c) Bamboos.
- (d) Minor produce, such as gums of sorts, roots, fruits, flowers, etc.
22. There is no data available as to quantities consumed during the past years.
23. The lines of export are from Salimgarh and Arnodh to Jaura, and other places in Central India, from Salingarh, Partabgarh to Mandsor and Neemuch, and from Damodar and Saripipli to Neemuch and Arki Railway Station for Nasirabad. With the exception of Partabgarh-Mandsor road which can be used throughout the year, the others are all fair-weather roads with steep ghats at places, but as the timber, etc., is not exported during the rainy season owing to the people being all engaged in cultivation the fair-weather roads are no disadvantage. The alignments at steep places may be improved, and the forests gradually opened out for carts and camels. At present the Bhils have to take on their heads bamboos and timber from two to twenty miles to the hâts, and hence much trade cannot be expected. The absence of roads has in one way been a boon, as with no forest conservancy the forests would by this time have disappeared if they were passable for roads. The produce of the western portion can be floated in the Erau and the Jakhan and other small nallas during the rainy season if necessary, but the major part of the produce of the forests of this State must go by land to Neemuch and other places in Malwa as has been the case in former years. 2. Lines of export.

3. Markets.

24. The Cantonments of Neemuch and Nasirabad and the towns in Central India are the chief consumers of the forest produce of the forests in Partabgarh and will also be in the future.

4. Mode of extraction, and its cost.

25. As no departmental operations have been carried out, the cost of extraction is not known. The timber, bamboos and other forest produce have been brought to the hâts by the Bhils living in the forests. The traders resort to these hâts, and buy it there from them, and pay the royalty on removing that produce. Sometimes the traders make advances to the Bhils for the produce they want them to cut and bring to the hâts.

5. Net value of each class of produce.

26. As no departmental operations have ever been undertaken the net value of any kind of produce is not known. The following are the rates of royalty charged for different kinds of forest produce by the Customs Department.

V.—MISCELLANEOUS FACTS.

1. Forest Staff.

27. No forest staff has been employed.

2. Labour supply.

28. As no departmental work have ever been undertaken it cannot be said for certain whether the supply of labour will be sufficient for the forest work or not. Bhils are the only labourers that can, under the present circumstances, be depended upon for forest work, as they have been living on forests and their produce for ages, and for more than six months in the year even at present live on the forest. The Bhils are an indolent race, and do not care to do any work that entails much labour. Large trees of useful species which, if cut and converted, are left to rot in the forest, while young poles which comparatively realize an insignificant amount are cut and carried to hâts.

The use of the saw is not known. These men will have to be encouraged to use the saw, as it will not only be more profitable to the State but to the Bhils as well.

PART II.

FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED.

29. The proposals are based on the assumption that the forests require to be protected and improved, and that therefore not more than one ton per acre of small timber, from dead, dying, malformed and stunted trees be obtained during the first period; that the firewood-yielding trees should not at present be exploited except, so far as they may be actually interfering with the growth of more valuable trees, or be growing in localities where fuel can readily be sold. (See paras. 38 to 41.)

1. Basis of proposals.

30. That leaving the reproduction of areas covered by tree growth to nature, assisted to a certain extent by wounding the soil round seed bearers or cheap broad cast sowings, it is proposed to sow or plant up with teak, grassy blanks to the extent of 300 acres per annum. Nurseries should also be established in places where water can be made available if required, and near these blanks to fill up the blanks caused by failures in sowings. (See paras. 51 and 52.)

31. That special fire conservancy measures over the whole area will, under the present condition of the forests, be too costly, and may therefore be only undertaken over a portion, leaving the rest for the present to the chance and good-will of the people.

32. That lac culture may be taken in hand, owing to large areas covered by species suited to it. (See para. 54.)

33. It is proposed to divide the forest area into five working circles as under :—

1. Working circles, how composed; reasons for their formation.

- (1) Salimgarh working circle.
- (2) Partabgarh working circle. This will comprise the southern part of the reserve, its north-western boundary being the Partabgarh-Sohagpur ridge.
- (3) Johlar working circle, the path from Phungatalai to Deolia and on to Partabgarh being its limit.
- (4) Pal working circle, a straight line passing from Pal to Nakar and on to the eastern boundary of the forest.
- (5) Saripipli working circle. This will comprise the remaining forest. The whole forest requires protection and improvement. The reason for its division is to make it convenient to the Bhils living in the forest to take produce to the different hâts they are accustomed to.

In working circles 1, 2 and part of 3 carts can go into the forest, and though at present these portions are comparatively poorer in growth, with protection these working circles will be more valuable owing to their access to carts. The working circles have been made after due consideration to the convenience of the people inhabiting the forests.

The division into larger number of working circles than those formed will render the supervision difficult.

2. Compartments; justification of the sub division adopted.

34. Each of the working circles is proposed to be divided into fifteen more or less equal parts. The boundaries of these, wherever possible, may be ridges or ravines or paths; if none of these exist straight lines may be cleared. No attempt has been made to divide the compartments according to the condition of the growing stock, because if this be attempted they will be of very irregular shape and size. Conformation of the compartments with the yearly coupes is all that is necessary or desirable. It is proposed to divide each working circle into fifteen compartments and, as the present mutilated and deformed stock is intended to be extracted in thirty years, each coupe is to be gone over twice in this period after an interval of fifteen years.

3. Analysis of crop. Method of valuation adopted.

35. The crop consists of malformed and mutilated growing stock of valuable species, with inferior species not saleable at present owing to remoteness of centres of consumption in a better State. As it is simply proposed to improve the growing stock, area check—with the removal only of those trees that can, strictly under sylvicultural conditions, be removed—is considered sufficient. Detailed valuations under this simple treatment are not considered necessary.

METHOD OF TREATMENT.

1. Object sought to be attained.

36. The object to be attained is to maintain these lands as forests, to exert beneficial influence in attracting rains, and to maintain a water supply which, in a locality depending mainly on rains for its water supply, is a no small factor, and to yield as much revenue to their owner as is consistent with the above condition, and the wants of the local population; provided their existence as forests is not only maintained but improved as well. The object sought for is the same in all the working circles.

2. Method of treatment adopted.

37. It is proposed to work the forests on the improvement-felling method. Only those trees which are unsound, dying or malformed or trees of inferior species that may be interfering with the growth of promising individuals of more valuable species, will be marked and felled.

3. Exploitable age.

38. No data are available to fix the exploitable age of the different species comprising the crop. There are next to no mature trees of the species that are at present saleable. The forests have been open to anybody who had the inclination to enter and cut anything he wanted, and the trees have been treated in a most barbarous manner. As the requirements of the local people are chiefly of small-sized timber, the trees of the species that yield such timber are not allowed to grow beyond those dimensions, and are cut down as soon as they approach those sizes.

39. Nor is it necessary for the present proposals to fix the exploitable age, as the main object is to put the forests on the way to improvement, only dead, dying, mutilated and deformed trees of the valuable species, and such trees of the inferior species that may actually

be interfering with the growth of promising individuals of the valuable kinds being removed.

After fifteen years, for which these proposals are framed, the condition of the forests will have been considerably improved, and data about the rate of growth of various species collected; it will then be time to decide about the exploitable age of the crop.

THE FELLINGS.

40. The working scheme will be similar in all the working circles. Of the 280 square miles, about eighty square miles is land covered merely by grass only, and therefore, only 200 square miles will yield anything during the first period of fifteen years. In the first period it is not intended to remove more than a ton of timber per acre or $200 \times 640 = 1,28,000$ tons.

General working scheme and calculation of the possibility.

Out of this the department has to meet demands of right-holders. The population inside the forest area is sparse, and I do not think more than 10,000 souls will have to be provided for or $\frac{10,000 \times 4 \times 15}{27} = 22,222$ tons or 22,300 tons in round figures, leaving a surplus of $(1,28,000 - 22,300) = 1,06,700$ tons, for sale or export.

41. Beside the above there will also be a certain quantity of firewood available for sale, but for the present the demand for it is meagre. The proportion of trees cut not suitable for timber and the trees of inferior kinds felled to half the growth of valuable kinds may be disposed of as firewood or turned into charcoal.

42. The bamboos may also be worked systematically. Three compartments of each working circle, be opened alternately for bamboo cuttings and then closed till the remaining ones are worked. In this way the areas will have a rest for four years. The quality of the bamboos will also be improved, and the fear of the bamboos being extirpated in more accessible localities, diminished. It is expected that about eight to ten lakhs of bamboos will be available for sale during the first period.

43. The fellings are prescribed for a period of fifteen years, at the close of which the scheme may be revised in the light of experience gained and data collected during the first period.

2. Period for which fellings are prescribed.

44. The area to be felled annually is about one-fifteenth of the area of each working circle. As the forests have not yet been demarcated the order of their allotment is not fixed. But as the forest is in the same condition everywhere it is immaterial in which order the fellings take place. The fellings should be started at one end of the working circle, and continued towards the other in consecutive order. As it is proposed to divide each working circle into fifteen compartments corresponding with the coupes of the first period, the compartments should be numbered from the side the fellings are commenced.

3. Area to be felled annually or periodically in the order of the allotment.

4. Nature and mode of executing the fellings.

45. It is proposed to work the forests on the improvement-felling system. The trees to be felled will be marked by the Forest Officer who, while marking the trees for fellings, will observe the following rules :—

- (i) No sound-growing trees of any of the timber-yielding species shall be marked for felling on any account.
- (ii) All dying, malformed and unsound trees of timber-yielding species be marked for fellings provided :—
 - (a) No isolated trees, however deformed or unsound, be marked.
 - (b) No trees standing on a precipitous or very steep ground be marked.
 - (c) No trees standing on the borders of a large blank be marked.
- (iii) Trees of species not yielding timber be only marked for fellings if they be actually interfering with the growth of promising individuals of valuable species or are likely to interfere within a short time. The trees felled should be cut flush with the ground and the stools properly dressed, except in the case of trees over six feet in girth which are not likely to produce coppice shoots; such trees may be felled six inches to one foot above the ground.

46. The Bhils may be allowed to cut the trees marked and take them to the appointed markets, but some of the trees marked will not be cut by the Bhils as they will not yield any timber. These may be cut departmentally, and the produce, if any, saleable, sold. Whatever agency be employed, the cutting and dressing of stools properly should be carefully looked after.

5. Fore cast of condition of crops at their conclusion.

47. After the conclusion of the first period of fellings there will be an improved stock of valuable species :—

- (a) Of coppice shoots of one to fifteen years old.
- (b) Of self-sown seedlings of different ages.
- (c) Those trees reserved during the first period. The production per acre will increase from one to three or four tons per acre. Thus at the conclusion of the period the stock will at least be three times its present value if not more.

SUPPLEMENTARY REGULATIONS.

1. Cleanings, thinnings or other improvement fellings.

48. The result of protection is that along with valuable species undesirable kinds of vegetation, such as climbers, etc., have a better chance to spread. Sometimes inferior kinds of trees get an upper hand of their more valuable neighbours and thus render the interference of the forester necessary. The creepers, specially of larger kinds, render their victims of little value as timber trees and even kill them outright. These should be cut down. Once in five years will be enough to go round for this purpose as well as for helping the more valuable kinds against attacks of their less valuable but more aggressive neighbours. Sometimes bamboos

will interfere with the growth of teak, and this should be helped by cutting down a few bamboos. Sometimes individuals of the same species may be growing too closely for their healthy development, and then they require to be thinned, but during the first period it is not likely that this will be required.

49. The grass is so very plentiful, and the cattle, except in a few cases, not numerous enough, to cause any apprehension on this account. The people graze more or less in all the forests nominally, but generally only in the vicinity of their villages. The grazing right may safely be admitted, but the number of cattle belonging to each village should be recorded. They may at the same time be allowed an increase of fifty per cent. over the number thus recorded. Any excess over this should be paid for if admitted in the forests; but certainly there should be no right to graze any cattle above the prescribed number. This is necessary because the grass and grazing may become more valuable in future by opening up of the country by roads.

2. Grazing and other rights.

50. The other rights are for timber, usually of small poles and saplings, and bamboos for house building and for agricultural implements; firewood for burning and for sale in head loads by Bhils. Minor produce such as gums, lac, honey, flowers, fruits, etc., are for personal wants. The collection of minor produce for sale should, I think, be regulated by passes, so that persons collecting it may have no chance to cheat the State by taking it away by routes where there are no Nakas. Some forest produce is smuggled into Mewar, from Sita Mata and other portions of the forests—this should be stopped.

51. The areas that are at present under tree growth may, for the present, be left to nature for improvement in the growing stock, assisted whenever necessary by wounding the soil round seed bearers, and broadcast cheap sowings in suitable places, with protection from fire, while the self-sown seedlings will fill up the gaps; but the large grassy blanks in all the working circles may, with advantage, be planted up. The areas which have fairly deep soil should first be taken in hand, for instance such as a large blank between Kotwal and Datiar and another large one above the Ghata and round Rampuria and other villages are.

3. Sowing, planting or other works special to each circle.

It is proposed that 300 acres per annum be sown with teak seed in lines twenty feet to thirty feet apart.

The failures in sowings may, during the succeeding year, be filled up by putting out seedlings. The cost of sowing will be Rs. 2 annas 8 to Rs. 3 per acre or say Rs. 900 per 300 acres.

52. Proportionate increase of more valuable species in the forests should as far as possible be encouraged by sowing, planting, cutting, etc.; nurseries will also have to be established for filling up blanks caused by failures in sowings.

53. The first improvement required is the opening out of the forests by paths passable for carts. With protection the growing stock

4. Improvements common to whole area.

will improve, and in time even timber of large dimensions will be available, and in small quantities is even now available, but as there are no roads the Bhils do not utilize it, and unless the forests are opened out by roads it will be difficult to extract it economically. If there were roads the rate of royalty could be enhanced. Moreover it will be found cheaper to lay out the roads now and keep the lines clear, than to cut the forest when it has grown too thick with protection. It will not be possible to make the roads at once owing to paucity of funds, but it will be better to lay them out and wait for construction till funds are available. As far as possible the lines may be so as to conform with the boundaries of the compartments, because then they will serve not only the purpose of roads alone, but of boundary lines as well as fire lines. Hâts for the Forest Staff may also be constructed at suitable localities.

MISCELLANEOUS.

1. Miscellaneous prescriptions.

54. Khankra (*Butia frondosa*),

Bor and Kat Bor { *Zyzyphus (jajuba)*,
 " (*nummalaria*),
 " (*zylapara*),
 and Pipal ... (*Ficus religiosa*),

are the species suited for lac culture in the forests of this State.

The seed of lac, growing on these different species, should be obtained and propagated on them. This measure will enhance the value of the forests. These species are at present not much used.

2. Changes proposed in the Forest Staff.

55. The cost of the establishment proposed is:—

				Per Annum. Rs.
Part pay of Superintendent of Forests, and his office	...	...	...	1,200
Forest Officer on Rs. 80 to Rs. 150, or say, Rs. 90 per mensem	...	...	...	1,080
Forester on Rs. 15 to Rs. 40, say Rs. 25 per mensem	...	...	...	300
1 Clerk on Rs. 25 p. m.	...	...	...	300
1 Moharir on Rs. 10	...	...	...	120
4 Peons on Rs. 5 each	...	...	...	240
3 Forest Guards on Rs. 10 each	...	...	...	360
3 " " 8 "	...	...	...	288
4 " " 7 "	...	...	...	336
5 " " 6 "	...	...	...	360
10 " " 5 "	...	...	...	600
TOTAL				5,184

It is also proposed that land revenue of the villages situated in the reserve be realized by the forest staff, and thus there will be a saving of:—

				Per Annum. Rs.
1 Magra Hakin on Rs. 18	...	...	...	216
2 Patwaris " 10	...	...	...	240
1 Sowar " 10	...	...	...	120
6 Mazkuris " 4	...	...	...	288
TOTAL				864

Thus the net charge will be (Rs. 5,184 - Rs. 864) = Rs. 4,320 per annum, or for the whole period of fifteen years = Rs. 64,800.

56. The following figures will show roughly the financial results of proposed working during the first period of fifteen years :—

3. Financial results of proposed working.

I. RECEIPTS.							Rs.
106,700 tons of timber @ Rs. 3 per ton	...	...	...	...	...	...	3,20,100
40,000 cart-loads of firewood @ 8 annas each	...	...	...	...	...	...	20,000
8,00,000 bamboos @ 5 annas per 100	...	...	...	...	...	...	2,500
Grass grazing and other minor produce	...	...	...	...	...	...	10,000
TOTAL RECEIPTS							3,52,600

II. CHARGES.							Rs.
Demarcation	...	...	...	...	...	...	8,000
Sowing, planting, nurseries and lac culture	...	...	...	...	...	...	18,000
Roads	...	...	...	...	...	...	12,000
Buildings and their up-keep	...	...	...	...	...	...	2,500
Cleanings, thinnings, and other works of improvement	...	...	...	...	...	...	10,000
Fire conservancy	...	...	...	...	...	...	23,000
Purchase of tools and plant	...	...	...	...	...	...	2,000
Pay of establishment	...	...	...	...	...	...	61,800
Travelling allowance	...	...	...	...	...	...	18,000
Contingencies	...	...	...	...	...	...	7,000
TOTAL CHARGES							1,65,300
NET SURPLUS							1,87,300

The rates of produce have been kept the same as the present royalty charge. At all places where the produce will have to be—and revenue—collected by departmental agency, the expenditure on harvesting will be met by the increased rates realized.

It may be said that the State has been making more revenue from its forests without any special establishment and charge, but the revenue was more at the expense of the forest than by harvesting of the normal yield. Moreover some of the State revenue was at the expense of the Banswara State, which must cease, as that State has also started to be alive to its own interest.

57. As the preparation of working plans depend on the amount of data available, it is proposed to keep up the records in the form prescribed by the Forest Department Code as far as possible.

4. Collection of data and upkeep of Record and Control forms.

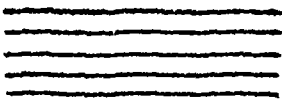
5. Sample plots.

58. To obtain reliable information regarding the rate of growth of different species composing the crop, it is suggested that at least two sample plots of half-an acre or more be selected and marked out ; and measurements of girth at four-and-a-half feet from the ground taken every year and recorded in the register to be opened for that purpose. To ensure the measurements being taken at the same place year after year a band of white paint should be painted round every tree. The trees in the plots should also be numbered.

6. Fire conservancy registers and maps.

59. The area burnt in any forest should be noted in the fire conservancy register, and tracings of each forest showing the compartments be kept up for the record of fire. One tracing will serve for five or more years and will show at a glance the area burnt in any year. Supposing a fire conservancy map was started in 1907, it will show :—

Areas burnt in 1907.



" " 1908.



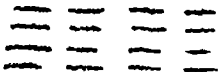
" " 1909.



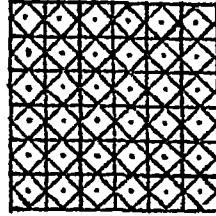
" " 1910.



" " 1911.



If the same areas are not burnt over year after year the map may serve for several years, otherwise it may be renewed after every five years. The extreme case of a forest area being burnt during each of the five years of the period will show as under :—



60. Forest journals showing the work done in each of the working circles during the year, with its cost and revenue, if any realized, should be kept up. Any special features of the year, such as dryness or otherwise, prevalence of extraordinary hot winds, occurrence and severity of frost, should also be noted. The number of compartments felled, the quantity of timber and other produce removed, and with whose agency removed, should also be noted.

Forest
Journal.

61. Control Forms 2 and 4 prescribed in the Forest Department Code, 6th Edition, should also be kept up.

Control
forms.

APPENDICES.

APPENDIX I.
Description of Forests in the Partabgarh State.

No.	Forest.	Boundaries.	Elevation, Aspect, Soil, etc.	Description.	Remarks.
1	Partabgarh Deolia Forest.	North, West and South— State boundary and part of Ringtali village lands. East—Fatehgarh, Khar Khara, Kankria, Sagtali, Kanar, Lalgah, Aehrauda, Brauli, Jhajpur, Khiraut, Mandilgarh, Satriya Khesi, Putabgarh, Salingah, Maraula Bamotar, Dhulmi, Manpuri, Damodar and other villages.	Elevation about 700 to 1,650 feet. Aspect, all aspects are represented. Slope is very variable, and consisting of a series of ridges running more or less from East to West with valleys and plateaus. It is mild over larger portions of the forest, but there are several places where very steep to precipitous ground is met. Soil is very variable from black cotton soil to sandy loam, and at places gravelly bare rock and shallows only are met with on precipitous and very steep ground; no leaf mould.	A mixed forest with very varying proportions of Teak, Sador, Dhaur, Rohin, Khankra, Khair, Khejra Salur, Karali, Godlia, Kharpatia and Bamboo, with a sprinkling of Haldu, Kalam, Mahura, etc. Leaf canopy from very nearly complete along the courses of streams and other sheltered places to very open and interrupted. The stock is much mutilated and deformed. Large trees are met with of only those species which people do not cut either on account of there being no demand for them or on account of their flowers and fruits. Along the banks of the Sita Mata stream there are fairly big trees of Knura, Arjan, Jamun, Mangoes and Chiranj. A few trees of Temru of good size are also noticeable. Young advanced growth of Ghorar and Mahura along the banks of this stream is doing splendidly, but in other parts of the forest young growth has no chance against annual fire. Bamboos are cut too high above the ground.	Protection with improvement-fellings and planting up of large grassy blanks is proposed.
2	Salingarh Forest.	North—Khaguri village lands and State boundary. East—Silingarh, Rajpur, Manpura, Kangarh and Amboramb village lands. South and West—State boundary.	Elevation 1,200 to 1,910 feet. Aspect, all aspects, but a general one to West. Slope almost level to very steep. Soil generally good, deep one and fertile, but at places rocky and shallow. No leaf mould is found.	A mixed Tenk forest with its usual companions. The stock is much mutilated. Leaf canopy rather open.	Improvement-fellings and protection recommended.

APPENDIX II.
List of Trees commonly found in the Forests of *Portuguese State*.

No.	Name.	Local Name.	Uses to which may be put.
1	<i>Acacia arabica</i> ...	Babul ...	Cart wheels, agricultural implements, sugarcane presses and house building.
2	" <i>catechu</i> ...	Khairin ...	House posts and agricultural implements.
3	<i>eucophloe</i> ...	Khejra ...	Agricultural implements.
4	<i>Adina cordifolia</i> ...	Haldu ...	Beams, doors and for turnings.
5	<i>Ægle marmelos</i> ...	Bill, Billi ...	Beams, karis, leaves for fodder, fruit in medicine.
6	<i>Ailanthus excelsa</i> ...	Arun ...	For floats only; may be used as a help in rafting heavy woods.
7	<i>Albizzia lebeck</i> ...	Sarin ...	For beams, oil and sugarcane presses and for bangles.
8	" <i>procera</i> ...	Ghorur ...	" " "
9	<i>Anogeisus acuminata</i> ...	Kaur ...	Agricultural implements, carts, house-building.
10	" <i>latifolia</i> ...	Dhaura ...	" " "
11	<i>Balanites Roxburghii</i> ...	Hingot ...	Fruit and wood ashes used in native medicine.
12	<i>Bassia latifolia</i> ...	Mahun ...	Beams, flowers for spirit and food and seed for oil.
13	<i>Bauhinia purpurea</i> ...	Kral ...	Flower pickled, wood for agricultural implements and house-building.
14	<i>Bombax malabaricum</i> ...	Semlia, Hemlia ...	Scabbards for swords, boxes for packing or to help in floating heavy woods.
15	<i>Boswellia thurifera</i> ...	Salar, Halar ...	Charcoal for iron smelting for live hedges.

16	<i>Briedelia retusa</i> ...	...	...	...	Augura	...	...	...	House-building, turning and carving.
17	<i>Buchananian latifolia</i> ...	...	...	...	Charoya	...	...	...	Boxes, furniture and yokes for bullocks, kernel of the fruit is exported as chiraunji.
18	<i>Butea frondosa</i> ...	...	...	...	Khankra	...	...	...	Firewood bark of roots in rough cordage, bark in killing fish, lac insect may be reared on it.
19	<i>Carissa carandas</i> ...	...	...	...	Kraunda	...	...	...	Firewood and hedges, fruit eaten.
20	<i>Caesaria tomentosa</i> ...	...	...	...		...	...	...	Agricultural implements and house-building.
21	<i>Cassia fistula</i> ...	...	...	...	Amaltas	...	...	...	Fruit used in native medicine.
22	<i>Dalbergia latifolia</i> ...	...	...	...	Shisham	...	...	...	For house-building furniture and carts.
23	<i>Diospyros melanoxylon</i> ...	...	...	...	Temru	...	...	...	" "
24	" <i>montana</i> ...	...	...	...	Ambia	...	...	...	" "
25	<i>Erythrina suberosa</i> ...	...	...	...	Dhaura Khankra	...	...	...	Firewood.
26	<i>Enginia jambolana</i> ...	...	...	...	Jaman	...	...	...	House-building and agricultural implements.
27	<i>Ficus bengalensis</i> ...	...	...	...	Bar	...	...	...	For shade and firewood.
28	" <i>religiosa</i> ...	...	...	...	Pipla	...	...	...	" may be used for lac culture.
29	<i>Garuga pinnata</i> ...	...	...	...	Kharpatia	...	...	...	Beams. Fruit is pickled.
30	<i>Gmelina arborea</i> ...	...	...	...	Sevan	...	...	...	For furniture and house-building.
31	<i>Grewia vestita</i> ...	...	...	...	Dhaman	...	...	...	For carrying-pole and for furniture.
32	<i>Holarrhena antedysenterica</i> ...	...	...	...	Dhudhi	...	...	...	Wood for carving and furniture, seed in native medicine.
33	<i>Lagerstrœmia parviflora</i> ...	...	...	...	Kakria	...	...	...	House-building and agricultural implements.

No.	Name.	Local Name.	Uses to which may be put.
34	<i>Mallotus philippinensis</i> ...	Kanila ...	Firewood. Fruit used in dyeing silk.
35	<i>Mangifera indica</i> ...	Anba ...	Door leaves, beams, etc., fruit eaten.
36	<i>Melia indica</i> ...	Limba ...	House-building and furniture.
37	<i>Mimusops indica</i> ...	Khirmi, Ruin ...	Oil presses and turning.
38	<i>Odina wodier</i> ...	Godlia ...	For beams and furniture.
39	<i>Ongenia dalbergioides</i> ...	Kanaj ...	Cart poles and agricultural implements.
40	<i>Phoenix sylvestris</i> ...	Khajur ...	For beams, juice for gar and spirits, fruit eaten.
41	<i>Phyllanthus emblica</i> ...	Ambha ...	Agricultural implements, fruit for dyeing and eating, bark for tanning.
42	<i>Santalum album</i> ...	Sandal ...	Wood oil.
43	<i>Schbichora trijuga</i> ...	Kacham ...	House-building and agricultural implements.
44	<i>Schriborn swietenoides</i> ...	Mokha ...	" " "
45	<i>Soyimida febrifuga</i> ...	Rohin ...	" may be used for Railway sleepers also.
46	<i>Stephegyno parvifolia</i> ...	Kalam ...	" and agricultural implements.
47	<i>Sterculia Uron</i> ...	Karali ...	Firewood and as a help for floating heavy timbers.
48	<i>Tamarindus indica</i> ...	Imbli ...	Cart wheels, oil presses and furniture.
49	<i>Tectona grandis</i> ...	Sag ...	House-building, furniture, railway sleepers, etc., etc.
50	<i>Terminalia arjuna</i> ...	Arjan ...	Beams, etc.

51	<i>Terminalia bellerica</i>	...	...	...	...	Bahora	...	...	...	Well work. Fruit in dyeing and native medicine.
52	" <i>tomentosa</i>	...	...	...	...	Sador	...	...	...	House-building, agricultural implements, etc.
53	<i>Vitex negando</i>	...	...	...	...	Vana	...	...	...	Live hedges.
54	<i>Woodfordia floribunda</i>	...	...	...	...		...	...	...	Agricultural implements.
55	<i>Wrightia tinctoria</i>	...	...	...	...	Khivni	...	...	...	For turning; for bangles.
56	<i>Zyzyphus jujuba</i>	...	...	...	...	Bor	...	...	...	Agricultural implements, lac insect may be reared on it.
57	" <i>nummularia</i>	...	...	...	...	"	...	...	...	Bed-posts and walking sticks "
58	" <i>zylopapa</i>	...	...	...	...	Kat bor	...	...	...	Firewood, insects may be reared on it.